

REMARKS

Claims 1-20 are pending.

Claims 1-5 and 16-20 have been canceled pursuant to the election made in a reply filed on November 12, 2004.

Claim 9 and 15 are also canceled.

Claims 6, 7, 8 and 13 are amended.

New claims 21-39 have been added.

After entry of the amendments submitted herein claims 6-8, 10-14, and 21-39 remain pending.

The Applicants would like to thank the Examiner for noting that claims 9 and 10 contain allowable subject matter.

I. Amendment to Specification

Paragraph [0016] of the Specification is amended to indicate that the thickness of the intermediate layer 120 described in this paragraph is as illustrated in FIG. 1d. Typographical errors in this paragraph regarding the reference numeral for the intermediate layer are also corrected.

Paragraph [0018] of the Specification is also amended to clearly describe the thickness relationship between the main layer 130 and the intermediate layer 120 as shown in the originally filed FIGs. 1e, 1f and 1g. No new matter has been added by these amendments.

II. Claim Rejections

Claims 6-8 and 12-15 are rejected under 35 U.S.C. § 102(b) as being unpatentable over United States Patent No. 6,319,834 to Erb *et al.* ("Erb"). However, Examiner noted that the dependent claims 9 and 10 contain allowable subject matter.

In response, the Applicants have amended the independent claim 6 to incorporate the limitation of originally filed claim 9 and claim 9 has been canceled. Accordingly, amended claim 6 and claims 7, 8, 10-14 depending therefrom are now in allowable form. Withdrawal of the rejection of claims 6-8 and 10-14 and their allowance are requested.

A new independent claim 21 has been added to claim another aspect of the invention as described in amended paragraph [0018] and FIGs. 1e, 1f and 1g of the Specification as originally filed. Claim 21 recites that the second interconnect layer is thicker than the first interconnect layer. As described in paragraph [0018] of the Specification, for example, the provision of thicker main layer (the second interconnect layer) which has lower impurity level than the intermediate layer (the first interconnect layer), the electrical resistance of the interconnect thus formed in the trenches are minimized.

The cited prior art references do not disclose the invention of claim 21. For example, the overburden layer (5) and the conductive layer (5') disclosed in Erb teaches away from the invention claimed in the new claim 21. Erb discloses that the overburden layer (5) is preferably thin and is meant to only provide a planar surface over the recesses (2', 2'', 2''') so that the subsequent CMP process is enhanced. (Erb, at column 6, line 35 - column 7, line 15; column 8,

line 56 – column 9, line 4). Thus, Erb does not teach or suggest the invention claimed in claim 21 and actually teaches away from the invention of claim 21.

Accordingly, Applicants believe that the new claim 21 is allowable over the cited references. Therefore, new claims 22-35 depending from claim 21 are also allowable. A favorable consideration of the new claims 21-35 is requested.

A new independent claim 36 has been added to claim another embodiment of the invention. In this embodiment, the plating bias voltage during the electro-chemical plating of the interconnect layer is continuously varied in order to create a complex series of layers within the interconnect layer in which a concentration gradient of the impurity metal is formed. The concentration of the impurity metal in the gradient is relatively higher near the substrate than further away from the substrate. A supporting disclosure for this embodiment may be found in the originally filed Specification, for example, at paragraph [0027].

The Applicants believe that the embodiment of the invention claimed in new claim 36 is also allowable over the cited references. New claims 36-39 depend from claim 36 and, thus, are also allowable. A favorable consideration of the new claims 36-39 is requested.

The Examiner rejected claim 11 under 35 U.S.C. § 103(a) as being unpatentable over Erb further in view of United States Patent No. 6,344,129 to Rodbell *et al.* In view of the discussion above, however, Applicants believe that this rejection is now moot. Withdrawal of the rejection of claim 11 is requested.

III. Other Amendments

Claims 7, 8 and 13 are amended to correct grammatical errors.

The amendments presented herein are all fully supported by the disclosure of the originally filed specification and no new matter has been added.

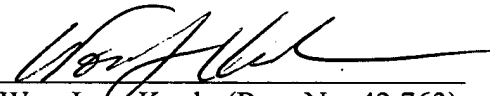
IV. Conclusion

Applicants believe that all pending claims 6-8, 10-14, and 21-39 are patentable over the cited reference and in condition for allowance.

The Commissioner is hereby authorized to charge the additional claim fee of \$350.00, determined in the attached Fee Determination Sheet, to Duane Morris LLP Deposit Account No. 50-2061. A duplicate of this sheet is provided.

Respectfully submitted,

Date: March 15, 2005



Won Joon Kouh (Reg. No. 42,763)
Attorney for Applicants

Customer No. 08933
Duane Morris LLP
(609) 631-2400 - direct
(609) 631-2401 - facsimile

In the Drawings:

Please replace the drawing sheet 3 containing FIG. 2 with the "Replacement Sheet" provided herewith. An "Annotated Marked-up Drawings" is also submitted herewith.

FIG. 2 has been amended to correct typographical errors in the flowchart boxes 206 and 208. "ECD" has been changed to "ECP" to correspond to that terminology used in the specification.